Mathematics Foundations and Theorems

Mathematics · Practice Test · 18 Questions

1. Which mathematical constant represents the ratio of a circle's circumference to its diameter?

A) e
B) phi
C) pi
D) gamma

2. What is the sum of the interior angles of a triangle in Euclidean geometry?

A) 90 degrees
B) 180 degrees
C) 270 degrees
D) 360 degrees

3. Which theorem states that for any right-angled triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides?

A) Pythagorean theorem
B) Fermat's Last Theorem
C) Euclid's theorem
D) Taylor's theorem

4. A prime number is a natural number greater than 1 that has no positive divisors other than:

A) 0 and 1
B) 1 and itself
C) 2 and itself
D) the square root of itself

5. In base-10 notation, what is the value of 0 factorial (0!)?

A) 0
B) 1
C) undefined
D) 10

6. Which sequence begins 0, 1, 1, 2, 3, 5, 8, 13, where each number is the sum of the two preceding ones?

A) Arithmetic sequence
B) Geometric sequence
C) Fibonacci sequence
D) Harmonic sequence

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7. What is the name for a polygon with eight sides?

A) Heptagon
B) Nonagon
C) Decagon
D) Octagon

8. In calculus, what does the derivative of a function represent at a given point?

A) The area under the curve
B) The instantaneous rate of change
C) The total sum of the function
D) The local minimum

9. Which mathematician is known for the law of gravity and the co-development of infinitesimal calculus?

A) Isaac Newton
B) Carl Friedrich Gauss
C) Leonhard Euler
D) Bernhard Riemann

10. How many sides does a dodecahedron have?

A) 8
B) 10
C) 12
D) 20

11. What is the value of the imaginary unit 'i'?

A) square root of 1
B) square root of -1
C) square root of 0
D) 1/0

12. A matrix that is equal to its own transpose is called a:

A) Symmetric matrix
B) Identity matrix
C) Singular matrix
D) Diagonal matrix

13. What is the term for a number that cannot be expressed as a ratio of two integers?

A) Rational number
B) Irrational number
C) Complex number
D) Integer

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14. Which branch of mathematics deals with the properties of space that are preserved under continuous deformations, such as stretching?

A) Algebra
B) Topology
C) Trigonometry
D) Statistics

15. What is the smallest perfect number?

A) 1
B) 4
C) 6
D) 8

16. In a Cartesian coordinate system, what are the coordinates of the origin?

A) (1,1)
B) (0,1)
C) (1,0)
D) (0,0)

17. Which of these shapes is a Platonic solid?

A) Cylinder
B) Tetrahedron
C) Ellipsoid
D) Cone

18. What is the result of any non-zero number raised to the power of 0?

A) 0
B) 1
C) The number itself
D) Undefined

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